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COUNTRY ANALYSIS BRIEFS

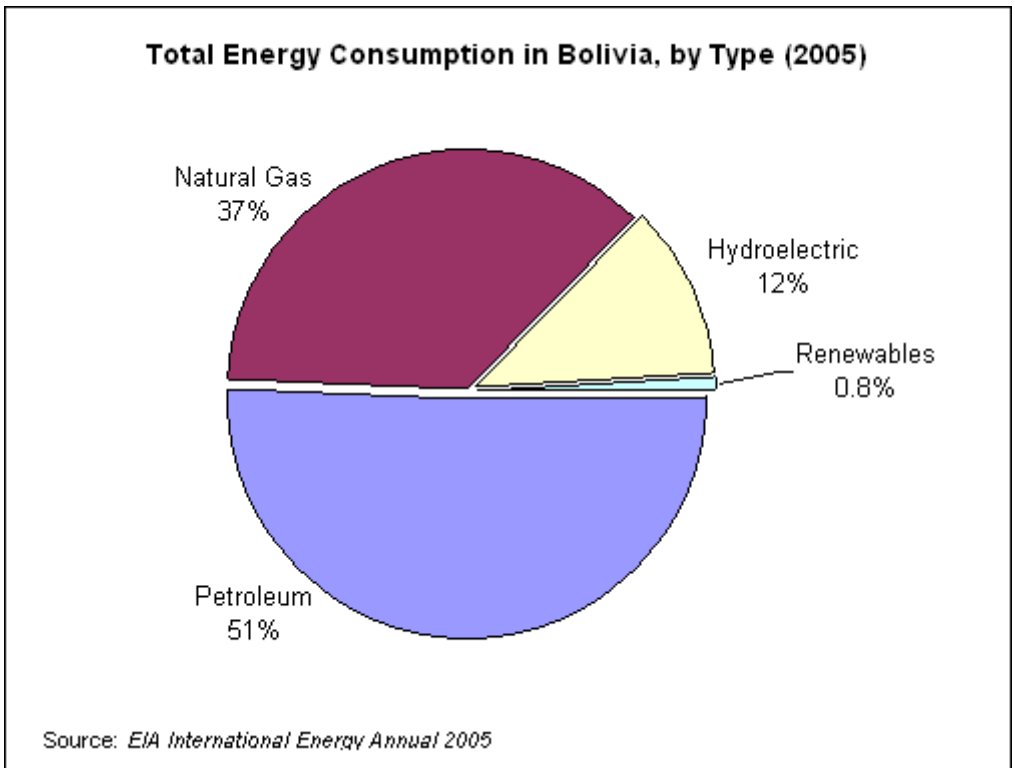
Bolivia

Last Updated: December 2007

Background

With one of the largest natural gas reserves in South America, Bolivia has the potential to become a natural gas hub in the Southern Cone (Argentina, Bolivia, Brazil, Chile, Paraguay, and Uruguay).

Bolivia has the second-largest proven natural gas reserves in South America behind Venezuela (see chart in Natural Gas section). The country's most important exports are natural gas, minerals, and agricultural products. Earnings from natural gas exports are an important driver of Bolivia's economic growth. In May 2006, President Evo Morales embarked on a campaign of resource nationalism, including the re-nationalization of all hydrocarbon resources and the renegotiation of export contracts with Argentina and Brazil. The impact of this campaign remains unclear: in the short-term, Bolivia has been able to secure higher prices for its natural gas exports, but foreign investment has been slow to recover to its former levels.



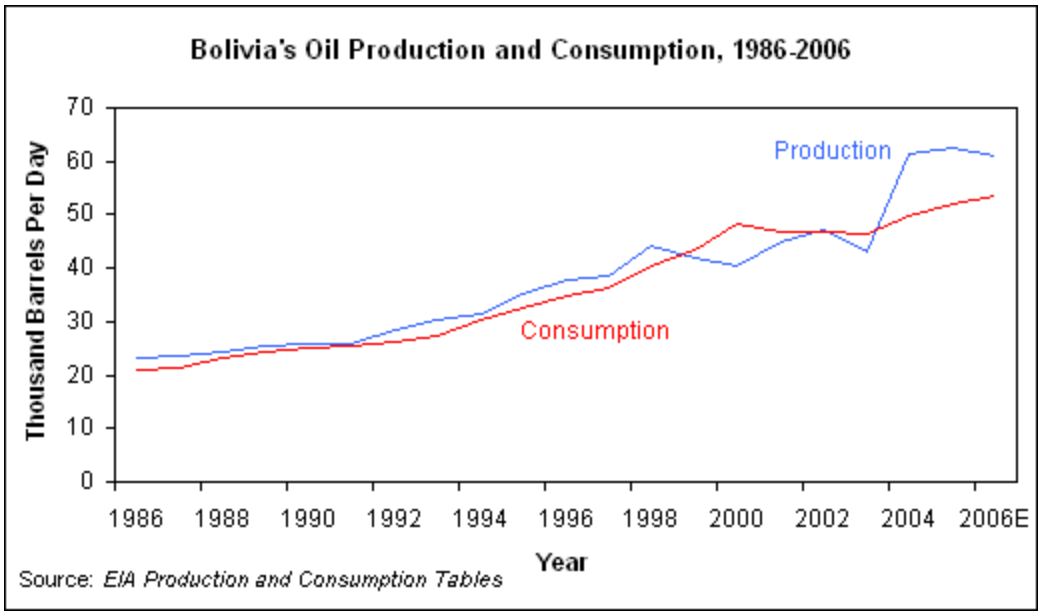
Oil

Bolivia meets most of its oil demand through domestic production.

The *Oil and Gas Journal* (OGJ) reports that Bolivia has proven oil reserves of 440 million barrels (mbbl) in 2007. This is a marked increase from the years prior to the privatization of the 1990's; exploration and production investments increased proven reserves from 132 mbbl in 1999 to 397 mbbl in 2000.

Exploration and Production

According to EIA estimates, Bolivia produced nearly 61 thousand barrels per day (bbl/d) in 2006 (including crude oil, condensates, natural gas liquids, and refinery gain). For 2006, Petrobras was the largest producer in the country followed by Repsol-YPF. Bolivia's consumption of 53 thousand bbl/d in 2006 provided an export opportunity of 12 thousand bbl/d of crude oil.



Pipelines

The private company Transredes controls the majority of the hydrocarbons transportation network for Bolivia. However, in line with Bolivia's nationalization plan, *Yacimientos Petroliferos Fiscales Bolivianos* (YPFB) will seek to become the majority partner in all projects originating in Bolivia. The 430-mile Northern System transports crude oil and condensates from Carrasco to the cities of Santa Cruz and Cochabamba. The 610-mile Southern System connects Yacuiba to Santa Cruz, carrying crude oil and liquefied petroleum gas (LPG). The 310-mile Central System links Santa Cruz with Cochabamba.

International Pipelines

Transredes operates an 18 thousand bbl/d crude oil pipeline between Cochabamba and Arica, Chile. The pipeline operates only occasionally.

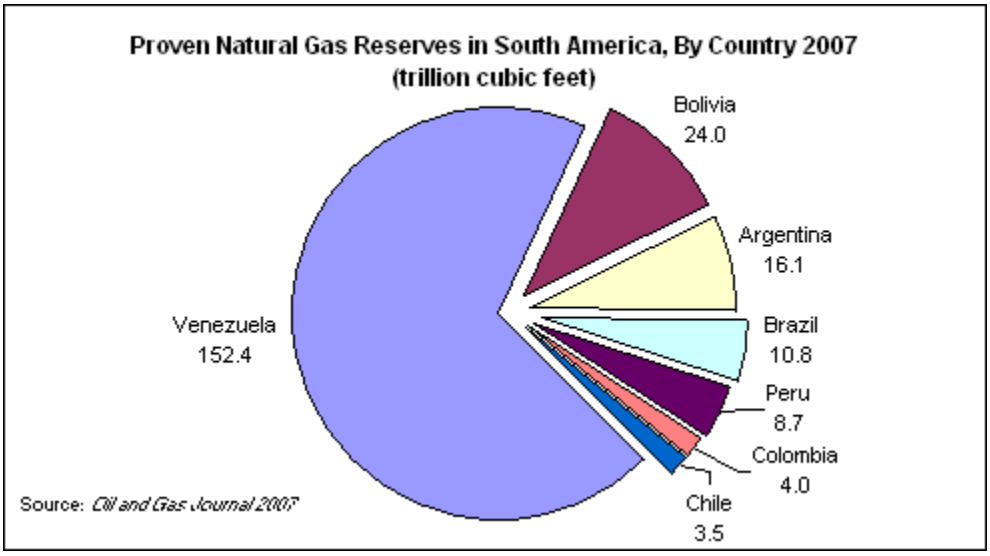
Downstream

According to *OGJ*, Bolivia had 41,200 bbl/d of crude oil refining capacity in 2007, a drop of 6,050 bbl/d from 2006. In May 2007, YPFB re-acquired the country's two refineries from Petrobras. These refineries meet the country's demand for gasoline and jet fuel. However, the country still imports other refined petroleum products, especially diesel, due to a lack of suitable domestic refining capacity. In early November 2007, Bolivia suffered a diesel shortage causing the Senate to approve an amendment to the Caracas Energy Agreement allowing Bolivia to import up to 250 thousand barrels of diesel fuel per month from Venezuela.

Natural Gas

Bolivia has the second-largest natural gas reserves in South America, after Venezuela.

According to Oil and Gas Journal (OGJ), Bolivia had proven natural gas reserves of 24.0 trillion cubic feet (Tcf) in 2007. The Tarija department contains over 85 percent of the country's total reserves, followed by Santa Cruz department (10.6 percent) and Cochabamba (2.5 percent).



In the mid-1990's, Bolivia privatized its natural gas sector, leading to an influx in foreign investment. The resulting increase in exploration led to a 600 percent increase in proven natural gas reserves from 1997-2005. There have been several important discoveries in recent years, many containing reserves (proven, probable, and possible) in excess of 10 Tcf. The most important of these finds include Margarita (13.4 Tcf), Ipati (12.0 Tcf), San Alberto (11.8 Tcf), and Sabalo (10.8 Tcf). However, since 2003, probable and proven reserves have declined slightly, as exploration has not kept pace with depletion from production.

Sector Organization

The development and export of Bolivia's natural gas reserves has been a controversial issue in the country. There are questions surrounding proposed export paths for liquefied natural gas (LNG), since Bolivia is landlocked. In 2001, Repsol-YPF led a consortium to develop the Pacific LNG project, which included a natural gas pipeline connecting an LNG export terminal to a port in Chile. The plan presented political problems due to a land dispute between Bolivia and Chile dating to the War of the Pacific (1879-1883), whereby Bolivia lost sea access. In 2003, the Bolivian government decided to move forward with the Pacific LNG project, sparking a wave of protests throughout the country that led to the resignation of President Sanchez.

The re-nationalization of Bolivia's natural gas resources could have an impact on the long-term development of the energy sector in the Southern Cone (Argentina, Bolivia, Brazil, Chile, Paraguay, and Uruguay). Bolivia's ability to expand its natural gas exports will depend upon its ability to harness its sizable proven reserves before competing gas sources (LNG, increasing domestic production in Brazil and Argentina, pipelines from Venezuela) entrench themselves in the region. In 2006, Bolivia formally joined a regional pipeline project intended to span South America from Venezuela to Argentina. The viability of such an expansive project is still in question.

Exploration and Production

Bolivia produced an estimated 466 billion cubic feet (Bcf) in 2006, and consumed an estimated 85 Bcf. Production has risen sharply since 1999, corresponding with the start of natural gas exports to Brazil. Officially, the largest natural gas producer in the country is YPFB; however, the two largest gas fields in Bolivia, San Alberto and Sabalo, which represent one-half of Bolivia's total natural gas production, are operated by Petrobras, Repsol-YPF, and Total.

Domestic Pipeline System

Transredes controls the majority of the hydrocarbons transportation network for Bolivia. However, in line with Bolivia's nationalization plan, YPFB will seek to become the majority partner in all projects originating in Bolivia. The 790-mile northern section of the system connects the cities of La Paz, Oruro, Cochabamba, and Santa Cruz with natural gas fields in the Chapare region. The 1,100-mile southern section of the system connects the cities of Sucre, Potosi, and Tarija with the natural gas resources of the Gran Chaco region; the southern system also connects domestic natural gas resources with export pipeline to Brazil and Argentina.

Exports

Bolivia's gas exports are rising and reached 362 Bcf in 2005.

Brazil

Brazil is the largest importer of Bolivian gas, importing between 900 million cubic feet per day (MMcf/d) and 1 Bcf/d in 2006, more than two-thirds of Bolivia's total natural gas exports. In 1999, Bolivia began exporting to Brazil under a 20-year, take-or-pay contract through the Gasbol pipeline. The 2,000-mile Gasbol connects Santa Cruz, Bolivia to Porto Alegre, Brazil, via Sao Paulo. The system has a maximum capacity of 1 Bcf/d. Gasbol also has a 170-mile, 100-MMcf/d extension that connects to a gas-fired power plant in Cuibana, Brazil.

The agreement between the two countries is a take-or-pay contract, meaning that Brazil often must pay for natural gas that it does not actually use. There have been times in the past when, due to dampened economic growth, Brazil has not been able to use the entire volume.

With the nationalization of hydrocarbons, Bolivia and Brazil entered into discussions regarding the price paid for transported gas. In February 2007, Bolivia and Brazil reached agreement for new prices on transported gas: gas destined for Cuiaba saw prices rise 285 percent to $4.20 MMBtu; and Brazil agreed to pay international prices for liquid components (ethane, butane, propane, natural gas liquids, and natural gas gasoline) received in the Gasbol pipeline.

Argentina

Bolivia began natural gas exports to Argentina in 1972. While significant exports stopped in 1999, the country resumed exporting sizable amounts of natural gas to Argentina in 2004 in an attempt to help alleviate the Argentine energy crisis (see the Argentina Country Analysis Brief for more information). Through October of 2007, Bolivia exported 270 MMcf/d to Argentina and has a contract to export up to 978 MMcf/d by 2010. As is the case with sales to Brazil, Bolivia sought to increase the price it receives from Argentina for natural gas exports. In June 2006, Argentina agreed to increase the price it pays for Bolivian natural gas to $5 per MMBtu from the previous $3.40 per MMBtu. To date, Bolivia has not sought to renegotiate this price.

Currently, Bolivia utilizes the 340-mile, 230 MMcf/d Yabog pipeline for these exports. The two countries have discussed increasing the volume of natural gas exports to Argentina. Such an expansion would require the construction of an additional pipeline, since the Yabog system is at full capacity. To that end, the two announced in August 2006 that they would launch a tender for the $2-billion, 750-mile Northeastern Pipeline. The system will have a maximum capacity of 700 MMcf/d, increasing Bolivian export capacity to Argentina to a level near its export capacity to Brazil. The project will also include a new natural gas liquids (NGL) separation plant in Bolivia that will supply LPG to Bolivian households.

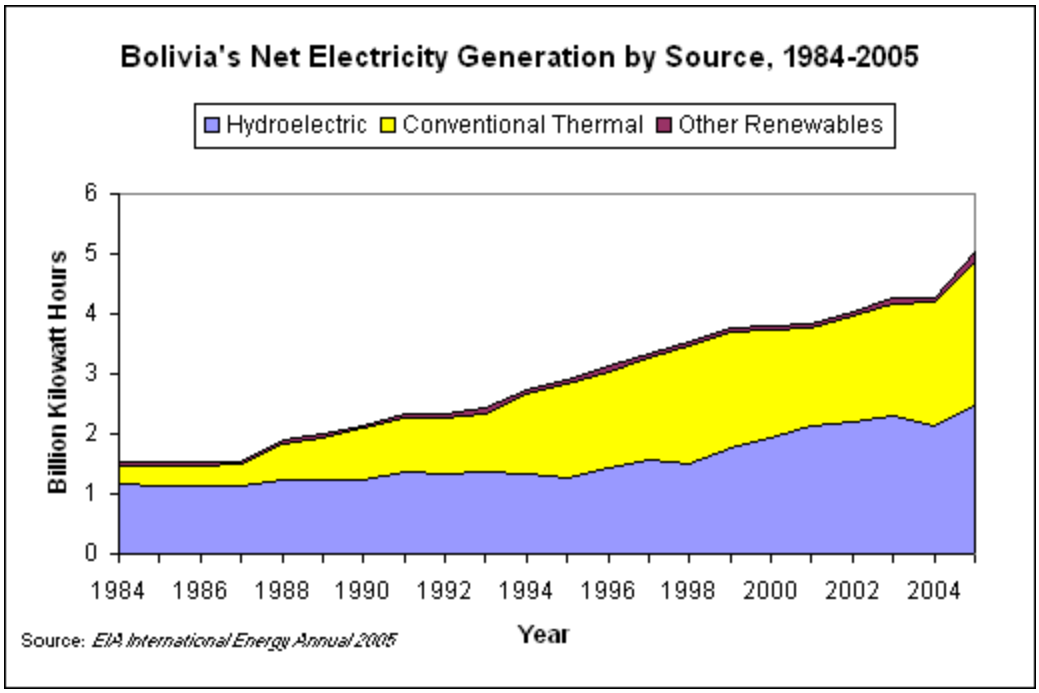
Electricity

Bolivia generates the majority of its electric power from natural gas-fired plants.

In 2005, Bolivia had 1.4 gigawatts of installed electricity generating capacity. The bulk of this capacity consists of conventional thermal plants, with hydroelectricity providing the balance. Bolivia's projected generation for 2005 was 5 billion kilowatt-hours (Bkwh) and consumption was 4.2 Bkwh. This does not include electricity generated in rural areas from biomass facilities, which are unorganized, decentralized, and difficult to quantify.

Unlike most South American countries, Bolivia is not heavily dependent upon hydropower for its electricity supply. In 2005, Bolivia had 460 megawatts (MW) of installed hydroelectric capacity spread amongst some 21 facilities throughout the country. CORANI operates the largest facility, the 93-MW Saint Isabel plant.

Bolivia had 960 MW of installed conventional thermal generating capacity in 2005. All of this capacity primarily burns natural gas, though a few plants also use diesel as a backup fuel. EGSA operates the 290-MW Guaracachil facility, the largest in the country. Other important facilities include the 130-MW Carrasco, operated by *Empresa Eléctrica Valle Hermoso* (EVH) and the 120-MW Bulo Bulo, operated by *Compania Eléctrica Central Bulo Bulo* (CECBB).



Sector Organization

In 1994, Bolivia privatized the state-owned electricity system, *Empresa Nacional de Electricidad, S.A.* (ENDE), unbundling generation, transmission, and distribution activities. The law forbids any single company from operating in more than one of these principal activities. The government also established ENDE as the principle regulator of the sector. The country has two principle electricity systems: the *Sistema Interconectado Nacional* (SIN) and the Aislado. The SIN connects major population centers and represents 83 percent of installed capacity. The Aislado system consists of numerous autoproducers and independent power plants in rural or isolated areas not served by the SIN.

Quick Facts

Energy Overview

Proven Oil Reserves (January 1, 2007E)	0.4 billion barrels
Oil Production (2006E)	61 thousand barrels per day
Oil Consumption (2006E)	53 thousand barrels per day
Crude Oil Distillation Capacity (2006E)	41 thousand barrels per day

Proven Natural Gas Reserves (January 1, 2007E)	24 trillion cubic feet
Natural Gas Production (2006)	0.5 trillion cubic feet
Natural Gas Consumption (2006E)	85 billion cubic feet
Recoverable Coal Reserves (2005)	1.1 million short tons
Coal Production (2006E)	None
Coal Consumption (2006E)	None
Electricity Installed Capacity (2005)	1.4 gigawatts
Electricity Production (2005E)	5 billion kilowatt hours
Electricity Consumption (2005)	4.2 billion kilowatt hours
Total Energy Consumption (2005E)	0.2 quadrillion Btus*, of which Oil (51%), Natural Gas (37%), Hydroelectricity (12%), Coal (0%), Nuclear (0%), Other Renewables (0.8%)
Total Per Capita Energy Consumption (2005)	23.8 million Btus
Energy Intensity (2005)	6,971.2 Btu per $2000-PPP**

Environmental Overview

Energy-Related Carbon Dioxide Emissions (2005)	12 million metric tons, of which Petroleum (63%), Natural Gas (37%), and Coal (0%)
Per-Capita, Energy-Related Carbon Dioxide Emissions (2005)	1.35 metric tons
Carbon Dioxide Intensity (2005)	0.4 Metric tons per thousand $2000-PPP**
Environmental Issues	the clearing of land for agricultural purposes and the international demand for tropical timber are contributing to deforestation; soil erosion from overgrazing and poor cultivation methods (including slash-and-burn agriculture); desertification; loss of biodiversity; industrial pollution of water supplies used for drinking and irrigation
Major Environmental Agreements	party to: Biodiversity, Climate Change, Climate Change-Kyoto Protocol, Desertification, Endangered Species, Hazardous Wastes, Law of the Sea, Marine Dumping, Ozone Layer Protection, Ship Pollution, Tropical Timber 83, Tropical Timber 94, Wetlands signed, but not ratified: Environmental Modification, Marine Life Conservation, Ozone Layer Protection

Oil and Gas Industry

Organization	Government controlled via Yacimientos Petroliferos Fiscales Bolivianos (YPFB)
Major Oil/Gas Ports	None (landlocked)
Foreign Company Involvement	BG, BP, Chevron, Petrobras, Pluspetrol, Repsol-YPF, Total
Major Oil Fields	Sabalo, San Alberto, Margarita
Major Natural Gas Fields	Sabalo, San Alberto, Vuelta Grande
Major Pipelines (capacity, Mmcf/d)	Gasbol (1.0 Bcf/d), Yabog (230 Mmcf/d)
Major Refineries (capacity, bbl/d)	Cochabamba (27,250), Santa Cruz de la Sierra (20,000)

* The total energy consumption statistic includes petroleum, dry natural gas, coal, net hydro, nuclear, geothermal, solar, wind, wood and waste electric power. The renewable energy consumption statistic is based on International Energy Agency (IEA) data and includes hydropower, solar, wind, tide, geothermal, solid biomass and animal products, biomass gas and liquids, industrial and municipal wastes. Sectoral shares of energy consumption and carbon emissions are also based on IEA data.
**GDP figures from OECD estimates based on purchasing power parity (PPP) exchange rates.

Links

EIA Links
EIA - Country Information on Bolivia

U.S. Government
CIA World Factbook on Bolivia
U.S. Embassy in Bolivia
U.S. State Department Background Notes on Bolivia
U.S. State Department Consular Information Sheet on Bolivia

Foreign Government Agencies
Ministry of Hydrocarbons
Superintendency for Electricity

Oil and Natural Gas
Transportadora Brasileira Gasoducto Bolivia-Brasil SA (TBG)
Yacimientos Petroliferos Fiscales Bolivianos (YPFB)

Electricity
Empresa de Luzy Fuerza Eléctrica Cochabamba (ELFEC)
Empresa Eléctrica Corani
Hidroeléctrica Boliviano
NRG Energy
Transredes
Transportadora de Electricidad

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International Gas Reporter
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International Oil Daily
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